

Agricultural Systems Technology II

Levels: Grades 10-12

Units of Credit: Year (1.0)

CIP Code: 010221

Prerequisite: None

COURSE DESCRIPTION

Students will learn basic skills needed to select, operate, maintain, service, sell and use agricultural power units, machinery, equipment, structures, and utilities. It includes instruction in agricultural power units; the planning and selection of materials for the construction of agricultural facilities; and the mechanical practices associated with irrigation, drainage, run-off, water conservation, erosion control, and farm welding, including oxy-fuel and arc welding, and other agricultural mechanization applications. The course will also include field or laboratory applications of concepts being taught.

CORE STANDARDS, OBJECTIVES, AND INDICATORS

STANDARD

010221-01 Students will develop an understanding of the role of FFA in Agricultural Education Programs.

OBJECTIVES

010221-0101 Students will explain FFA officer duties and responsibilities.

- Students will describe the duties and responsibilities of chapter FFA officers.
- Students will explain the proper dress and characteristics of a good FFA leader.

010221-0102 Students will Plan and organize an FFA meeting.

- Students will explain how to plan a meeting and develop the order of business.
- Students will describe how to set up the meeting room.
- Students will explain the parliamentary procedure used in an FFA meeting.

STANDARD

010221-02 Students will understand the benefits of a Supervised Agricultural Experience (SAE) Program.

OBJECTIVES

010221-0201 Students will keep and use SAE records.

- Students will explain how SAE records are organized.
- Students will identify the procedures to making entries in the SAE records.
- Students will explain how to summarize and analyze the SAE records.

010221-0202 Students will make long-range plans for expanding SAE Programs.

- Students will identify the factors that should be considered in expanding an SAE program.
- Students will explain how placement and ownership SAE programs may be expanded.

STANDARD**010221-03 Students will identify hazards in Agricultural Mechanics.****OBJECTIVES**

- 010221-0301 Students will identify the three conditions necessary for combustion.
- 010221-0302 Students will explain how to prevent fires in agricultural mechanics.
- 010221-0303 Students will identify the different classes of fires and the different types of fire extinguishers.
- 010221-0304 Students will describe the proper use of fire extinguishers.
- 010221-0305 Students will describe the different types of burns that can occur in agricultural mechanics.

STANDARD**010221-04 Students will demonstrate safe practices when working in laboratories and other enclosed facilities and when operating and working around laboratory equipment, materials, and chemicals.****OBJECTIVES**

- 010221-0401 Students will explain how to create a safe place to work.
- 010221-0402 Students will describe what each safety color means and where it is used.
- 010221-0403 Students will describe how to select appropriate protective clothing and devices for personal protection.

STANDARD**010221-05 Students will demonstrate basic electrical wiring skills and knowledge about electricity.****OBJECTIVES**

- 010221-0501 Students will explain electricity and identify safety practices that should be observed in doing electrical work.
- 010221-0502 Students will explore the science of electricity.
- 010221-0503 Students will measure electrical voltage, amperage and resistance.
- 010221-0504 Students will identify electrical tools and equipment.
- 010221-0505 Students will compare single-phase and three-phase systems.
- 010221-0506 Students will prepare and use schematics.
- 010221-0507 Students will wire circuits.
- 010221-0508 Students will repair and replace electrical cord.

STANDARD

010221-06 Students will maintain battery systems that supply energy to engines and accessories.

OBJECTIVES

- 010221-0601 Students will charge the battery with a battery charger.
- 010221-0602 Students will clean and maintain the battery terminals, cables, and battery box.
- 010221-0603 Students will replace fuses, circuit breakers, and light bulbs.
- 010221-0604 Students will use electrical test light to identify properly operating circuits.
- 010221-0605 Students will wire direct current electrical circuits.
- 010221-0606 Students will install a battery.

STANDARD

010221-07 Students will repair, recondition, and safely operate hand and power tools.

OBJECTIVES

- 010221-0701 Students will safely use portable and stationary power tools.
- 010221-0702 Students will sharpen, recondition, maintain, and properly store tools.

STANDARD

010221-08 Students will plan and construct with concrete.

OBJECTIVES

- 010221-0801 Students will plan a job using concrete.
- 010221-0802 Students will select concrete tools.
- 010221-0803 Students will prepare the site for the concrete pour.
- 010221-0804 Students will place, finish, and cure concrete.
- 010221-0805 Students will lay out the footings of a building.
- 010221-0806 Students will construct buildings or building components with concrete.
- 010221-0807 Students will build, set, and remove concrete forms.
- 010221-0808 Students will determine the amount of materials required to install a fence.

STANDARD

010221-09 Students will safely operate and maintain agricultural equipment.

OBJECTIVES

- 010221-0901 Students will conduct a pre-operation inspection of a tractor.
- 010221-0902 Students will observe warm-up and cool-down procedures of engines and machines.

- 010221-0903 Students will inflate tires to proper air pressure for optimum performance.
- 010221-0904 Students will describe the principles of operation of the internal combustion engine.
- 010221-0905 Students will identify engine systems and their respective functions.
- 010221-0906 Students will perform recommended periodic service jobs and maintain records of equipment maintenance and repair.
- 010221-0907 Students will use various equipment and machinery operator and repair manuals.
- 010221-0908 Students will pack bearings and remove and replace grease seals.
- 010221-0909 Students will properly lubricate equipment before operation and storage.
- 010221-0910 Students will select, maintain, repair and operate small engines.
- Students will schedule and replace fluids and filters.
 - Students will troubleshoot engine problems.
 - Students will clean and adjust carburetor for optimum performance.
 - Students will adjust throttle and choke linkages.
 - Students will service battery.
 - Students will service fuel strainer.
 - Students will service crankcase breathers.

STANDARD

010221-10 Students will service and maintain engine and drive systems.

OBJECTIVES

- 010221-1001 Students will service cooling systems.
- Students will test antifreeze.
 - Students will inspect and replace hoses.
 - Students will service fan belts.
 - Students will replace thermostat.
 - Students will replace water pump.
 - Students will inspect for leaks.
 - Students will flush cooling system.
 - Students will clean exterior of radiator.
- 010221-1002 Students will service drive assemblies.
- Students will follow general preventive maintenance program.
 - Students will replace belts.
 - Students will recognize malfunctions of drive assemblies.
 - Students will clean and lubricate drive parts.
 - Students will replace gaskets.
 - Students will replace and adjust chains.
 - Students will clean sprockets, chains, and gears.
- 010221-1003 Students will service hydraulic systems.
- Students will check hydraulic system for leaks.
 - Students will inspect and replace lines/hoses of the hydraulic system.
 - Students will drain, clean, flush, and refill hydraulic system.

STANDARD

010221-11 Students will select, maintain, and safely operate oxyfuel, shielded metallic arc welding (SMAW), and gaseous metallic arc (GMAW) welding systems.

OBJECTIVES

- 010221-1101 Students will weld mild steel in horizontal and vertical positions.
- 010221-1102 Students will weld butt welds in horizontal and vertical positions.
- 010221-1103 Students will weld fillet welds in horizontal and vertical positions.
- 010221-1104 Students will weld lap welds in horizontal and vertical positions.
- 010221-1105 Students will estimate and calculate the cost of welding materials.

STANDARD

010221-12 Students will fabricate with metal.

OBJECTIVES

- 010221-1201 Students will cut threads with taps and die tools.
- 010221-1202 Students will cut, thread and assemble steel pipe.
- 010221-1203 Students will connect flare and compression fittings.
- 010221-1204 Students will prepare grinding and sharpening equipment.
- 010221-1205 Students will fabricate shop projects using metal.